MovieTech

Instruction Manual
Magnum Dolly System

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Part I

The Magnum Dolly

Operation and set-up instructions

General Safety Tips:

1) The Magnum Dolly should only be used on stable, level surfaces at all times.

2) The entire lift range of the Magnums column, jib-arms incl. Duo Jib (max. platform height 272 cm / 8.9 ft) etc. must be kept clear and free from obstructions (0.5 m / 19.7 in clearance in all directions), whether switched on or off, at all times. When operating beware of pinch points.
Attention :The Duo Jib Arm may not be mounted or operated when the Magnum Dolly is fitted with pneumatic wheels.

3) Attention in automobiles or uneven surfaces. The Magnum Dolly must be secured so that it cannot move or roll.

4) In the electromechanical column there are 3 pneumatic springs which are under constant high pressure. Should the column be damaged or the mechanics interfered with, it may eject with high speed and strength.
The drive belt must be inspected and if necessary replaced after every 100 operational hours or at least every 12 months. The load carrying device must be inspected after every 100 operational hours.
To inspect or repair the column, the column must be extended fully to relax the pneumatic springs.

5) Absolute attention to balance must be observed at all times especially during set-up and operation.

6) When operating the Duo Jib in open air, the maximum operational wind speed of 32 km/h (19 mph) may not be exceeded.

7) When operating from mains, all usual guidelines for operating electrical equipment must be observed.

8) All electronical components should be protected from over exposure to moisture and humidity.

9) It is recommended to use safety belts when operating at heights above 1,50 m (5 ft).

Technical Specifications Magnum Dolly System

Basic Dolly	
Weight:	62 kg / 136 lbs
Minimum size for transport:	
Length:	64 cm / 25"
Width:	64 cm / 25"
Height:	37 cm / 14,5"
Max. Payload Capacity:	1000 kg / 2200 lbs
Maximum track width:	62 cm / 24"
Minimum track width:	36 cm / 14"

Basic Dolly and Electromechanical Column	
Weight of Magnum Column:	78 kg / 171 lbs
Transport sitze, assembled:	
Length:	64 cm / 25"
Width:	64 cm / 25"
Height:	80 cm / 31"
Maximum Payload Capacity:	148 cm / 58"
Column extended:	300 kg / 660 lbs
Column retracted:	800 kg / 1763 lbs
Max. height (euro-adapter):	148 cm / 58"
Min. height (euro-adapter):	80 cm / 31"
Lift range:	68 cm / 28"
Fastest time through column lift range:	
24 V	4,5 sec
48 V	3,2 sec
Sound level:	~ 20 dB
Battery performance when fully ranged:	150 column moves
Battery capacity:	8 Ah
Charge cycle with Mains / Charger Unit:	
1 A	8 hrs.
5 A	3 hrs.
Mains voltage:	110 / 220 V AC

Magnum Dolly with Duo-Jib	
Maximum Payload Capacity including 2 pers.	
with High Rig mode (photo 3c)	200 kg / 440 lbs
with Low Rig mode (photo 3)	220 kg / 484 lbs
Standart mode (photo 3a & 3b)	250 kg / 550 lbs
Max. Platform Height:	272 cm / 107"
Min. Platform Height:	26 cm / 10"
Lift range:	150 cm / 59"

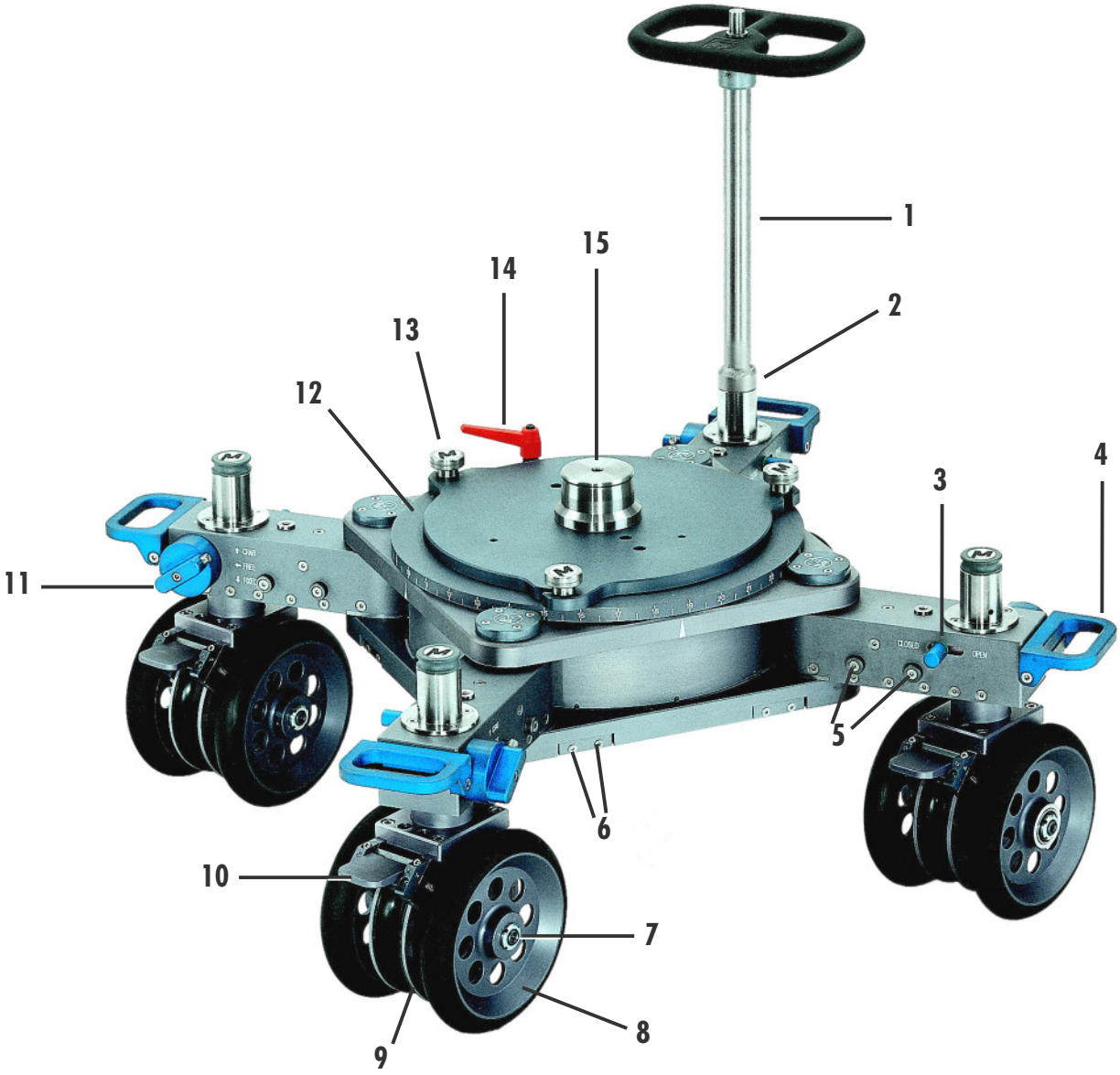
Magnum Dolly with Duo-Jib and TV-Platform	
Maximum Payload Capacity including 1 pers:	192 kg /423 lbs
Maximum Platform Height:	209 cm / 82"
Minimum Platform Height:	59 cm / 23"
Lift range:	150 cm / 59"

Magnum Dolly with Mini-Jibarm	
Maximum Payload Capacity:	80 kg / 176 lbs
Maximum Height (euro-adapter):	235 cm / 93"
Minimum Height (euro-adapter):	70 cm / 27"
Minimum Height with Mini Low Rig:	9 cm / 3"
Lift range:	165 cm / 65"

Magnum Dolly Low Rig	
Maximum Payload Capacity:	130 kg / 286 lbs
Maximum Height (euro-adapter):	78 cm / 30"
Minimum Height (euro-adapter):	10 cm / 4"
Lift range:	68 cm / 26"

Photo 1: The Magnum Basic-Dolly

Components Basic Dolly



1. Steering Rod
2. Steering Rod Socket
3. Wheel Arm Lever
4. Carry Grip
5. Tension Adjuster
6. Tension Adjuster
7. Looking Screw (wheel axles)
8. Studio Wheel
9. Track Wheel
10. Wheel Brake
11. Wheel Setting Clamp
12. Rotable Bearing
13. Euro Adapter Plate
14. Column Locking Screw
15. Rotatable Bearing Brake

The Magnum Basic-Dolly

The Basic Dolly (photo 1) is the basis of the Magnum Dolly System. It allows manouverability in a number of ways.

The wheel arms may be set in 16 different positions (see Figure 1).

Wheel Arm Positioning

The wheel arms may be repositioned by pulling the Wheel Arm Lever (pos. 3, photo 1). Upon reaching the required position, the Wheel Arm Lever should be gently released allowing the locking pin to slip into place. Ensure that the wheel arm is fixed securely.

Combi-wheel Settings

The Basic Dolly has 4 Combi-wheels. Each Combi-wheel consists of 2 Studio wheels and 1 or 2 track wheels. The Studio wheels can be exchanged for Pneumatic Wheels. This is done by simply removing the Locking Screw (pos. 7, photo 1) and removing the studio wheel. The pneumatic wheel is mounted in the same manner and locked in position with the Locking Screw.

Note: With versions that have the single track wheel please note that 4 of the 8 pneumatic or studio wheels have a nipple type connection. The other 4 wheels do not. For each of the Combi-wheels one wheel with nipple and one wheel without, should be mounted. The wheel with the nipple connection should be attached to the allocated connection.
The integrated Track Wheels allow smooth tracking movements without having to change the Combi-wheels.

For operating on track the wheels should be set at the Free position to enable them to compensate the tracks curve.

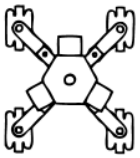
Ensure that the track is supported correctly and completely level.

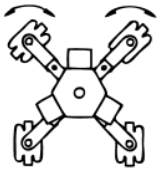
The Wheel Setting Clamp (pos. 11, photo 1) has 3 settings :

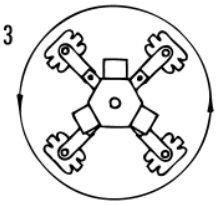
1) **CRAB** -> Enables connected steering of the wheels.
2) **FREE** -> Enables the wheels to rotate freely (for use on track).
3) **FIXED** -> Allows the wheels to be locked at set angles of 45 degrees.

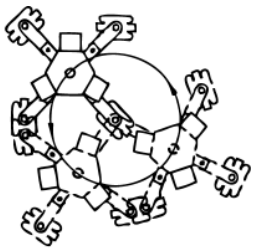
Examples for possible wheel settings on the next page.

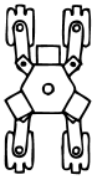
Magnum Dolly Wheel-settings

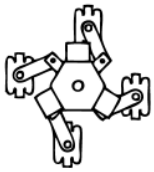
1 

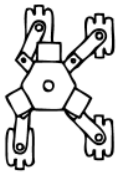
2 

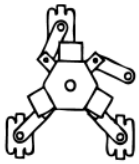
3 

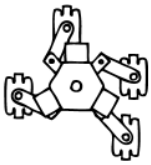
4 

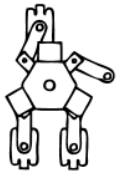
5 

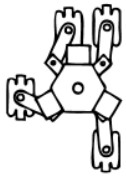
6 

7 

8 

9 

10 

11 

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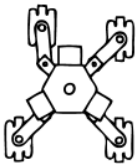
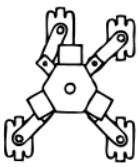
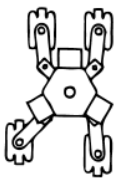
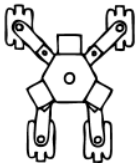
13 

14 

15 

16 

Rotation around an off-set axis (fig. 1.4)

1. Extend all wheel arms fully.
2. Extend all wheel arms fully.
3. With the Wheel Setting Clamp (pos.11 photo 1) set this combi-wheel on FREE.
4. The combi-wheel on the opposite side (diagonally) should be set on FREE and then positioned at 90° to the wheel arm. By selecting FIXED, this combi-wheel position will be secured. This combi-wheel may be used as the steering point.
5. The remaining two combi-wheels should be set on FREE and positioned at 45° to each of their wheel arms. These wheel positions may be locked by selecting FIXED.

Rotation around own central axis (fig.1.3)

1. Extend all wheel arms fully.
2. With the Wheel Setting Clamp (pos11. photo 1) put all wheels on FREE
3. Set all four combi-wheels at 90° to each of their wheel arms.
4. With the Wheel Locking Clamp, set all wheels on FIXED.

Two wheel steering (fig.1.2)

1. With the Wheel Setting Clamp (pos.11 photo 1) set all wheels on CRAB.
2. Select two of the combi-wheels that are parallel to each other and set them on FIXED.
3. Put the steering rod in the Steering Rod Socket (pos.2. photo 1) of either of the two wheels that are set on crab.

To return to 4 wheel steering set the Wheel Setting Clamp on each of the wheels at CRAB. Turn the steering rod until all 4 wheels connect. The Basic Dolly can be steered from each of the 4 wheel arms provided the designated wheel arm is switched to Crab.

Should the Combi-wheels of the Basic Dolly need adjustment because they are not running straight,(e.g. due to a bump or knock) the following action needs to be taken.

Older models::

1. Ensure that the Locking Clamps of all the combi-wheels are set at Lock.
2. Open the Locking Bolt above the Combi-wheel with an Allen Key.
3. With the help of a wheel locking bar, water level or any straight object align the wheels so that each set of two wheels are parallel to each other.
4. Re-lock the Locking Bolt.

Newer Models:

1. Ensure that the Locking Clamps of all the combi-wheels are set at Lock.
2. Directly above the track wheel there are 2 locking bolts. Loosen the locking bolts.
3. With the help of a wheel locking bar, water level or any straight object align the wheels so that each set of two wheels are parallel to each other.
4. Re-lock the Locking Bolt.

The Basic Dolly contains a Rotatable Bearing (pos. 12, photo 1) which allows complete panning of columns etc mounted on it. The rotatable bearing may be locked with the Rotatable Bearing Brake (pos. 15, photo 1).

Maximum payload on the Basic Dolly is 1000 kg.

The Basic Dolly accommodates 3 different fixtures:

1. Base Plate with Euro Adapter Mount
2. Manual Cranked Column
3. The Magnum Electromechanical Column

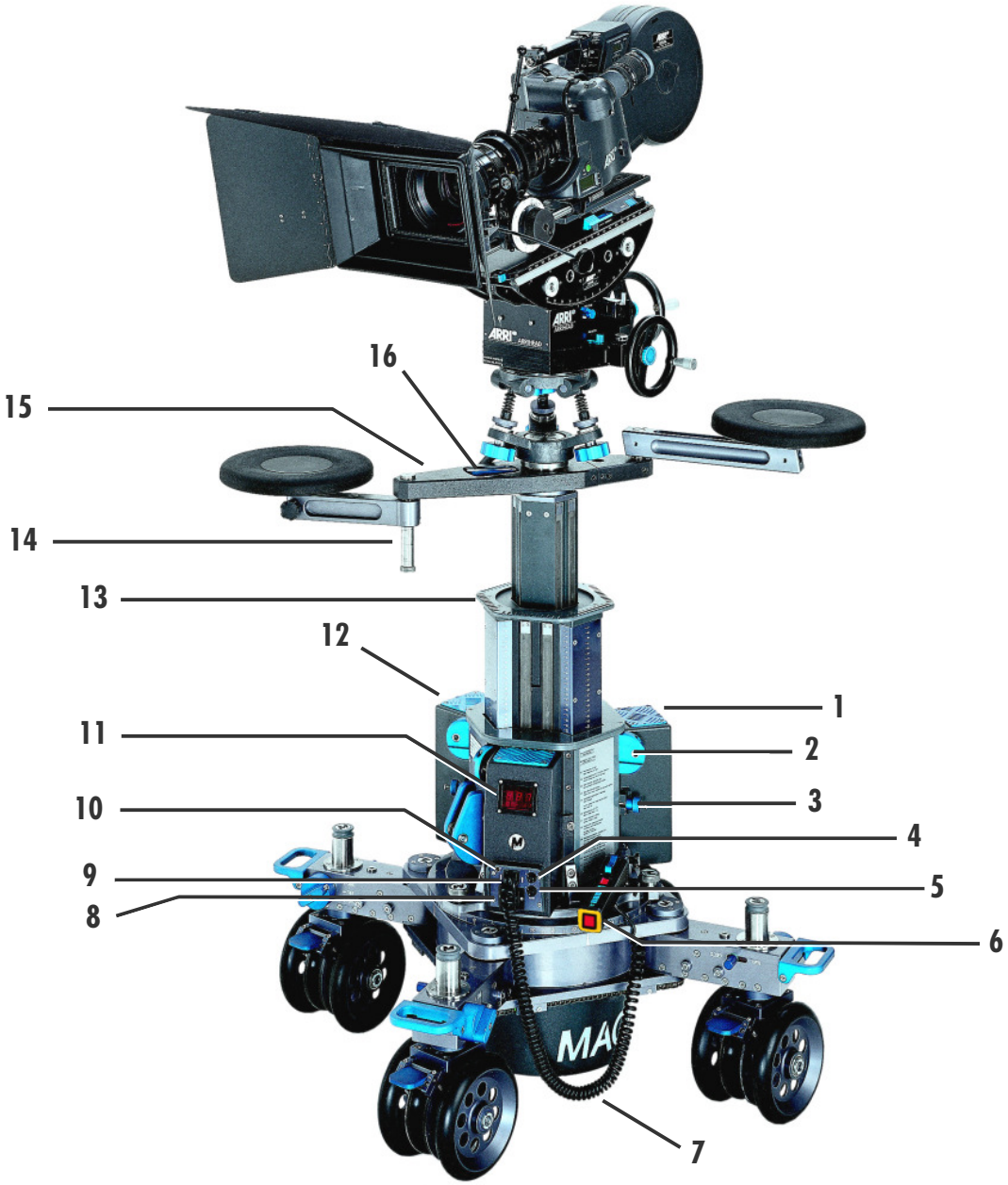
Base Plate with Euro Adapter Mount

Die The Base Plate with Euro Adapter Mount (pos. 13, photo 1), as with all 3 fixtures, is mounted on the Basic Dolly by simply positioning it on the dolly so that the 3 bayonet connections may be locked into position by the 3 Locking Screws (pos. 12, photo 1). Ensure that all 3 locking levers are tightened securely.

The Base Plate accommodates any accessory that connects to a Euro Adapter Mount.

Photo 2: Manual Electromechanical Column

Components MAGNUM-Column



1. Battery
2. Connection for Carry Bars
3. Battery Socket Flange
4. Programm Channel Selector
5. Drive Ramp Selector
6. Hand Control Unit
7. Hand Control Cable
8. Hand Control Cable Socket
9. Emergency Back-up Switch
10. Connecting for External Display
11. Digital Display
12. Battery
13. Foot Rest
14. Adjustable Seat Arm Bolt
15. Turnstile Mount
16. Turnstile Brake

Magnum Electromechanical Column

To operate the Magnum Column to its full potential it is important to understand the basic principles of how this column functions. We have endeavoured to explain this in simple terms.

The Magnum's motor, which is connected to a central spindle by means of a drive belt, powers the column upwards or downwards. Three pneumatic springs exerting an upward pressure provide the extra strength necessary to carry a maximun payload of 300kg. It is important to remember that the motor uses the least amount of energy when the column is loaded with approx. 145kg. This point should be taken into consideration when operating with battery power. To achieve the longest consumption time with a battery, always load the column.

The coordinating factor in the whole system is the Magnum Electronic. The electronic provides the motor with the instructions needed to allow smooth coordinated movements of the column. These instructions are in turn transmitted to the electronic from the operator via the Hand Control Unit.

When the Magnum Dolly is switched on, the initial stage is "stand by" i.e. the electronic system is activated. Within the first 1-2 seconds of activation the self diagnostic electronic makes an automatic system check to ensure that there are no faults present. In stand-by condition the column is held in position by an electromagnetic brake. By pressing the manual control switch the electromagnetic brake is deactivated and the motor moves the column up or down. When the column is no longer moving the motor regulates the position of the column for approximately 8 seconds. After 8 seconds the brake closes again and holds the column in position. During the time the motor is moving or regulating the columns position, energy consumption is at its highest. Upon activation of the electromagnetic brake energy consumption drops dramatically to an absolute minimum.

Getting Started - 24 Volt Version

Power supply:

The Magnum Column operates on 24 volt battery power or can be mains buffered at 110 V to 220 V by means of the Mains / Charger Unit.

Note: Always use the Mains / Charger Unit together with a fully loaded battery. Do not use Mains / Charger Unit on its own as this will damage the electronic.

Battery operation:

One or two batteries can be connected to the column by means of the socket flanges (pos. 3, photo 3). The Magnum will function with one battery or two. When operating with two batteries, energy will be consumed from both batteries simultaneously. For longer operational time it is recommended to use two batteries. It is also recommended to keep one fully charged battery in reserve. When the battery reaches 17 V an automatic shut-down will take place. The digital display on the electronic will show E06. The unloaded battery should be replaced by a charged battery. This automatic shut-down is meant to protect the batteries from being deeply unloaded i.e. below 17 V.

When operating with the Mains / Charger Unit one battery must be removed and the mains unit connected in its place. Ensure that the battery is charged. Check that the mains unit is switched to the correct voltage i.e. 110 V or 220 V. The voltage selector switch can be found on the rear side of the mains unit. Newer models are equipped with an automatic volt selector. Connect the mains cable to the mains unit and in turn to a mains power supply. Switch on. Upon switching the Mains / Charger Unit on, either the green or red LED will light up.

Should the green LED alight this indicates that the battery is fully charged. Should the red LED alight this indicates that the battery is not fully charged. At this point it should be explained that the Mains / Charger Unit also acts as a battery charger. As long as the column is not being driven the mains unit trickle charges the battery. The charging cycle takes approximately 4 hours. The mains unit can also be used externally as a charger with the aid of a Charger Adapter Plate.

Note: Newer models of the Mains / Charger Unit are fitted with a manual switch over from 1amp to 5 amp charge. It is recommended to charge the batteries once a week on the 1 amp cycle. Charging time is approx. 8 hours.

Getting Started – 48 Volt Version

Power supply:

The Magnum Column 48 volt system operates on 24 or 48 volt battery power i.e
1 or 2 batteries, or it can be mains buffered at 110 V to 220 V by means of the Mains / Charger Unit.

Note: Always use the Mains / Charger Unit together with fully loaded batteries. Do not use Mains / Charger Unit on its own as this will damage the electronic.

Battery operation:

One or two batteries can be connected to the column by means of the socket flanges (pos. 3, photo 3). The Magnum will function with one battery or two. When operating with one battery (24 volt) ensure that the " short circuit connector " is connected to the battery connecting pins located on the column. The digital display located on the Mains / Charger Unit will indicate which system has been selected i.e. 24 or 48 V. When operating with two batteries (48 volt), energy will be consumed from both batteries simultaneously. For longer operational time it is recommended to use two batteries. It is also recommended to keep two fully charged batteries in reserve. When the batteries reach 34 V an automatic shut-down will take place. The digital display on the electronic will show E06. The unloaded batteries should be replaced by a charged batteries. This automatic shut-down is meant to protect the batteries from being deeply unloaded i.e. below 17 V. per battery.

When operating with the Mains / Charger Unit ensure that the batteries are charged. Check that the mains unit is switched to the correct voltage i.e. 110 V or 220 V. The voltage selector switch can be found on the rear side of the mains unit. Newer models are equipped with an automatic volt selector. Connect the mains cable to the mains unit and in turn to a mains power supply. Switch on. Upon switching the Mains / Charger Unit on, either the green or red LED will light up.

Should the green LED alight this indicates that the battery is fully charged. Should the red LED alight this indicates that the battery is not fully charged. At this point it should be explained that the Mains / Charger Unit also acts as a battery charger. As long as the column is not being driven the mains unit trickle charges the battery. The charging cycle takes approximately 4 hours per battery. The mains unit can also be used externally as a charger with the aid of a Charger Adapter Plate.

Note: Newer models of the Mains / Charger Unit are fitted with a manual switch over from 1amp to 5 amp charge. It is recommended to charge the batteries once a week on the 1 amp cycle. Charging time is approx. 8 hours per battery.

Once the power supply has been provided the following procedure should be followed.

1. Ensure that the General Safety Tips have been followed

2. Connect the Hand Control Unit (pos. 6, photo 3) via the Hand Control Cable (pos. 7, photo 3) to the Control Cable Socket (pos. 8, photo 3) in the Electronic Unit Housing.

3. Select the required drive ramp (pos. 6, photo 3).

4. Activate the electronic by pressing the Main On / Off Switch integrated in the Hand Control Unit.

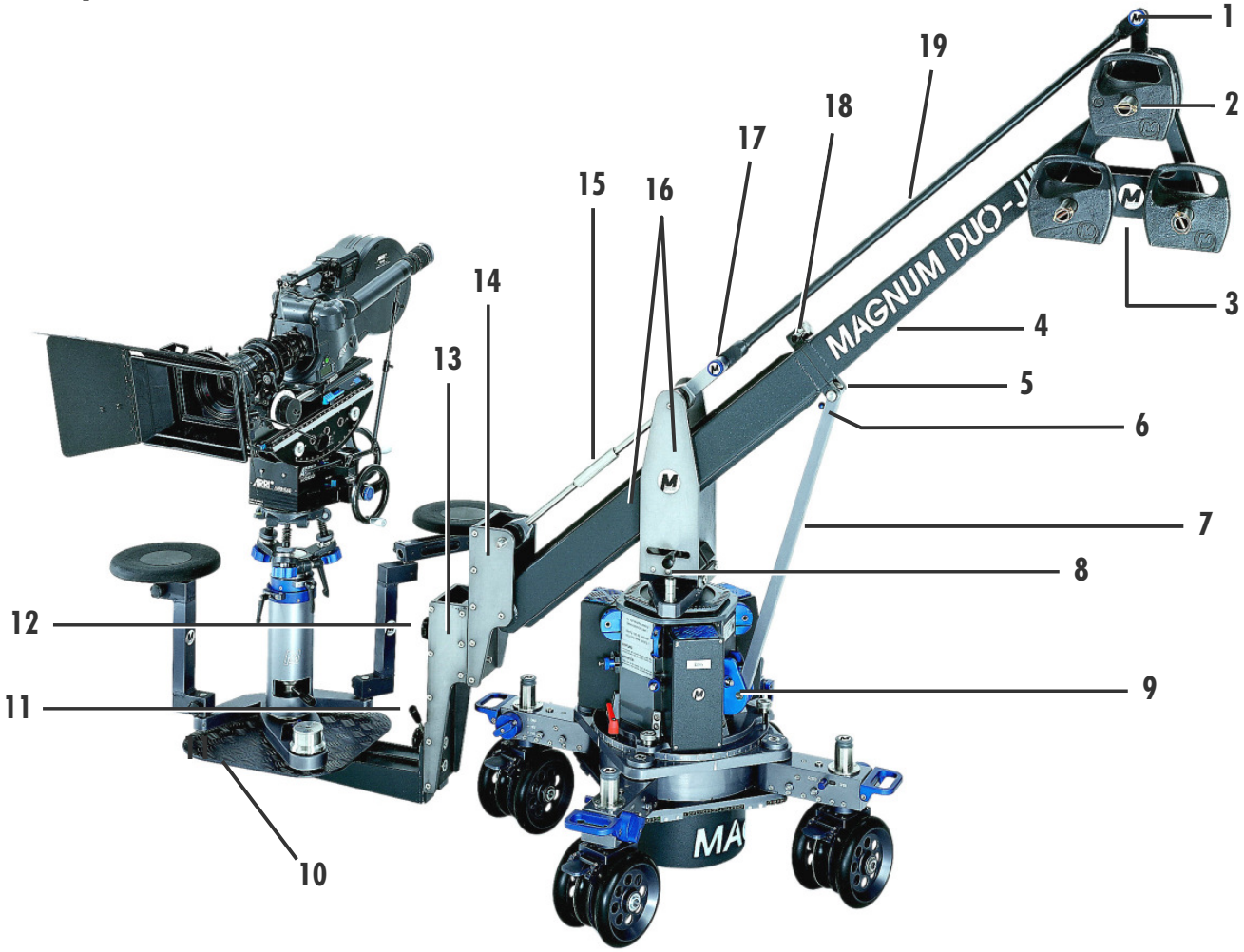
5. Press the Manual Control Switch in the desired direction i.e. forwards to go up, press back to go down.

   Note: Upon activation should the column be in a fully retracted or extended position, it is necessary to clear the two end switch areas. This simply means that the column should be driven, depending upon the activating position, either upwards or downwards approximately 120mm.

The column is now fully operational.

Photo 3: The DUO-Jib-Arm

Components Duo-Jib-Arm



1. Connection Pin
2. Counterweight Rod
3. Counterweight Triangle
4. End Section
5. Anchor Bracket Duo Jib
6. Automatic Locking Pin
7. Connector Rod
8. Fixing Lock
9. Anchor Bracket Column
10. Platform
11. Platform Locking Lever
12. High / Low Rig Locking Lever
13. High / Low
14. Front Section
15. Platform Leveller
16. Middle Section
17. Connection Pin
18. Endsection Lock
19. Parallelogramm Rod

Der DUO Jib Arm

The Duo Jib Arm may only be used on the Magnum Dolly. The following set-up instructions should be observed.

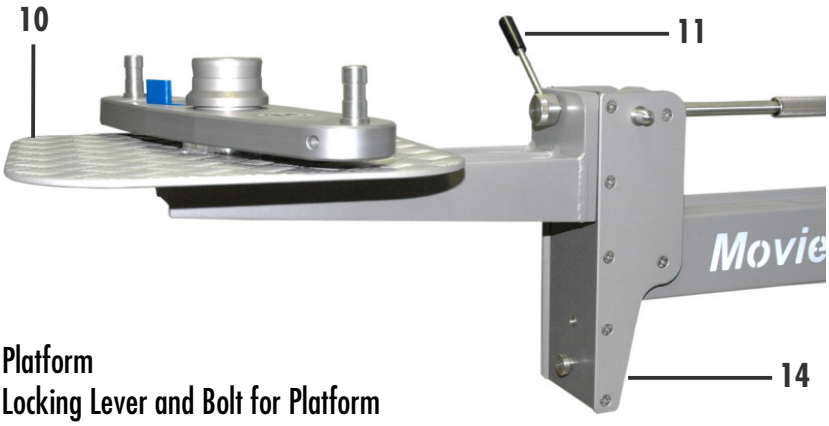
Attention: Before set-up and at all times during operation, ensure that either Drive Ramp 3 or 4 is selected. Do not operate the Duo Jib on Drive Ramp 1 or 2.
In the event of a power failure due to an electronical or battery cut out, it is recommended to have an appropriate ladder to enable the camera crew to dismount.

Attention: Do not use pneumatic wheels when mounting or operating the Duo Jib!

1. Extend all 4 wheel arms of the Basic Dolly fully (pos. 1, page 8).
2. Mount the middle section (pos. 16, photo 3) of the Duo Jib onto the column by connecting it to the Euro Adapter Mount.
3. Connect the Connector Rod (pos. 7, photo 3) to the Anchor Bracket on the column (pos. 9, photo 3). Insure that the Automatic Locking Pins are locked securely.
4. Connect the Connector Rod (pos. 7, photo 3) to the Anchor Bracket of the Duo Jib of the Duo Jib (pos.5, photo 3). Insure that the Automatic Locking Pins are locked securely.
5. Lock the middle section securely with the fixing lock (pos. 8 photo 3).
6. Mount the end section (pos. 4, photo 3) and tighten securely with the end section lock (pos. 18, photo 3).
7. Attach the Counterweight Triangle (pos. 3, photo 3) to end section.
8. Connect the parallelogram rod (pos. 19, photo 3) to middle section and counterweight triangle. Insure that the connection pins (pos. 1 and 17, photo 3) connect correctly.
9. On the lower connection of the front section (pos. 14, photo 3), mount, High / Low Rig (pos. 13, photo 3). Insure that locking lever (pos. 12, photo 3) is locked securely.
10. Connect the Platform (pos. 10, photo 3) to High / Low Rig. Insure that locking lever (pos. 11, photo 3) is locked securely. Maximum Payload capacity incl. 2 pers = 220kg / 485 lbs. For other versions see the following pages.
11. Insure that all connections are locked and tightened correctly.

No more than two counterweights should be loaded whilst the platform is unloaded. **As a general rule of thumb, for one person on the platform attach 4 or 5 counterweights, for two persons on the platform attach 8 or 10 counterweights.**
When operating the Duo Jib attention must be payed when mounting and dismounting the platform.
By two-man operation, remove the extra counterweights before one person dismounts i.e. no more than four or five counterweights should be left connected. Before the second person dismounts, reduce the amount of counterweights to three.
It is not recommended to drive the Duo Jib when the platform is unloaded and counterweights are attached. At all times attention must be payed to balance.

Photo 3a: Duo Jib Platform



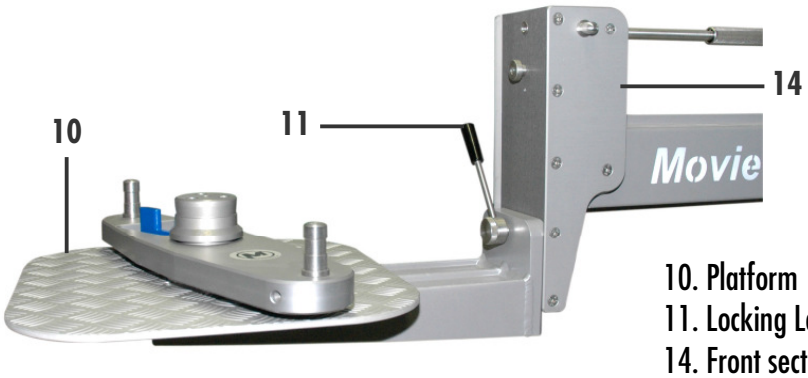
10. Platform
11. Locking Lever and Bolt for Platform
14. Front section

A) Connect the Platform (pos. 10, photo 3a) to the upper connection on the Front Section (pos. 14, photo 3a) as shown. Insure that the Locking Lever and Bolt (pos.11, photo 4a) are tightened correctly.

B) Insure that all connections are locked and tightened correctly.

Maximum Payload capacity inc. 2 per.= 250kg / 551 lbs

Photo 3b: DUO Jib Platform



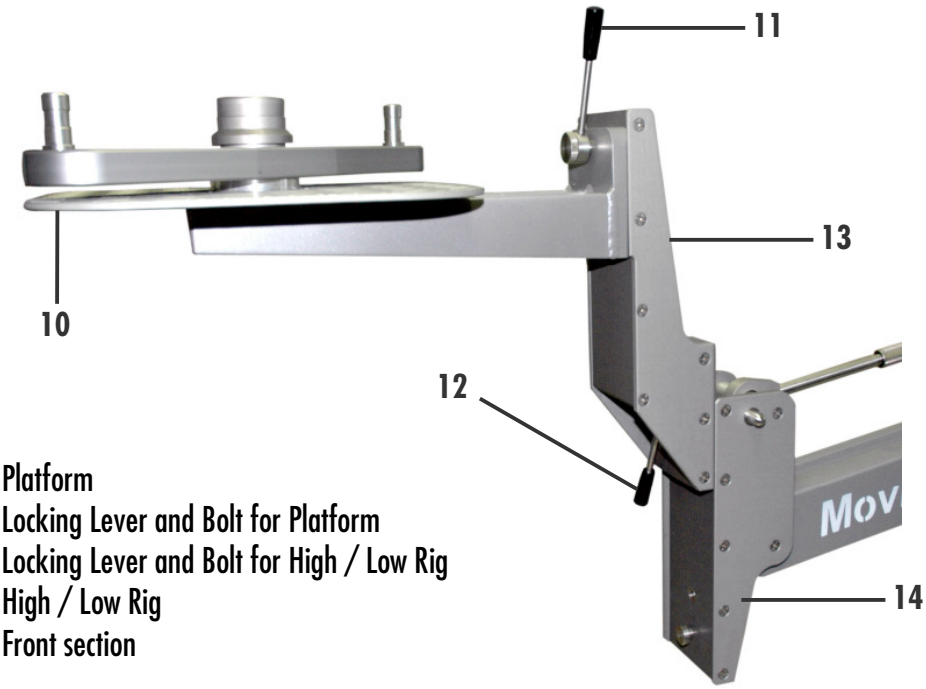
10. Platform
11. Locking Lever and Bolt for Platform
14. Front section

A) Connect the Platform (Pos. 10, Photo 3b) to the lower connection on the Front Section (Pos. 14, Photo 3b) as shown. Insure that the Locking Lever and Bolt (Pos. 11, Photo 3b) are tightened and locked securely.

B) Insure that all connections are locked and tightened correctly.

Maximum Payload capacity incl. 2 pers = 250kg / 251 lbs.

Photo 3c: Duo Jib Platform with High / Low Range



10. Platform
11. Locking Lever and Bolt for Platform
12. Locking Lever and Bolt for High / Low Rig
13. High / Low Rig
14. Front section

A) On the upper connection of the front section (pos. 14, photo 3c), mount, High / Low Rig (pos. 13, photo 3c) as shown. Insure that Locking Lever and Bolt (pos. 12, photo 3c) is locked securely.

B) Hand screw Bolt (pos 1, Photo 3d) into the hole (pos 2, Photo 3d).

C) Connect the Platform (pos. 10, photo 3c) to High / Low Rig as shown. Insure that locking lever (pos. 11, photo 3c) is locked securely.

D) Ensure that all connections are locked and tightened correctly.

Maximum Payload capacity incl. 2 per= 200kg / 440 lbs.

Photo 3d: High / Low Rig

1. Bolt
2. Threaded hole

When using the High / Low Rig as High Rig it is necessary to hand screw the Bolt (pos. 1, Photo 3d) into the Threaded Hole (Pos 2, Photo 3d).

Part II

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Advanced Version

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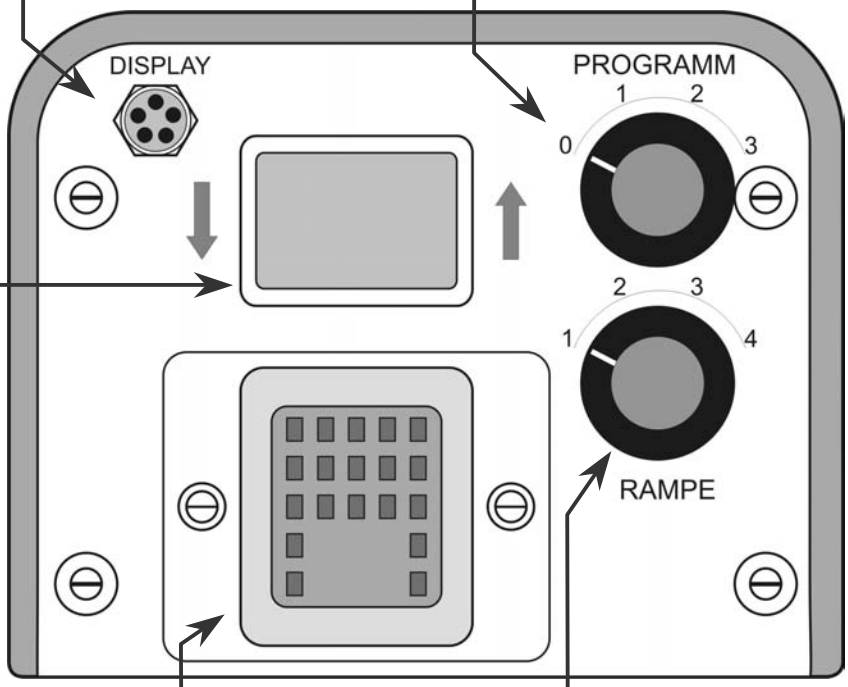
Order of Operating Elements

Program Channel Selector Switch
Channel 0: Lift range selection, Payload Display
Channel 1: Up to 30 set positions
Channel 2: Up to 30 additional set positions
Channel 2: Recording of a complete movement sequence including stops.

Connection for External Display



Emergency Back- up Switch
Only for use in the event of an electronic failure!

Connection for Hand Control Unit

Ramp Selector
1: Standard operation (100% acceleration)
2: Standard operation (80% acceleration)
3: Duo Jib operation 1 (70% acceleration)
4: Duo Jib operation 2 (60% acceleration)

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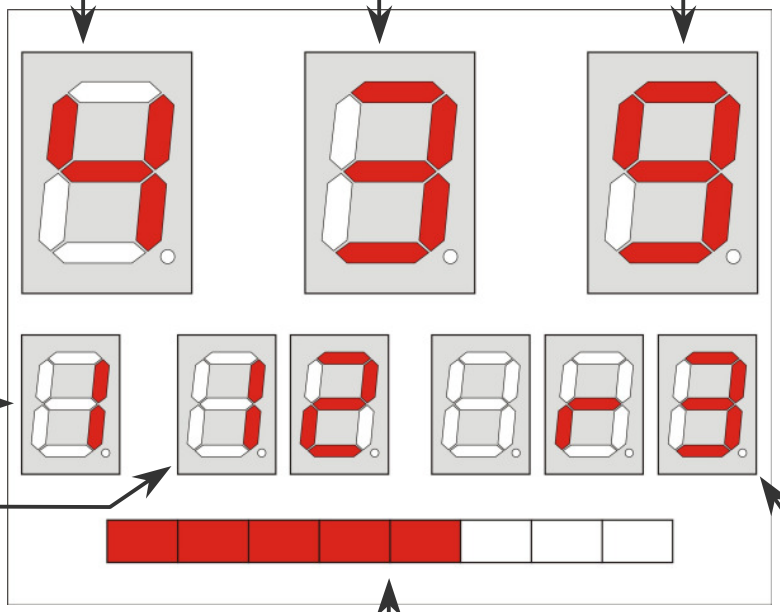
Explanation Multi- functional Display

Position Display (3 digits)
Shows the actual column position (here 439 mm) as well as the Error Display Code.



Channel Display (1 digit)
shows the selected Program Channel 0 - 3 (here Channel 1)

Linear Display (8 digits)
shows battery voltage e.g. 8 digits on, equals 26 V., 7 digits on, equals 25 V. etc. (Here the battery voltage is 23 V.). By selecting Channel 0 it is possible to determine the payload situation on Duo Jib mode (see p.6).

Program Display (2 digits)
shows information about the selected Program Channel. Shown here for example "12" which means that 12 positions have been memorized.

Additional information Display
shows additional information, for example " r3 ", Ramp 3 has been selected

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Starting

By operating the ON/OFF button (see diagram) the dolly may be turned on or off. As soon as the lamp inside the ON/OFF button lights up, the button can be released. After turn-on, a self test is performed by the electronic system for approx. 1 second. During this time, the manual control must not be touched. Otherwise the control erroneously recognizes an error and "E04" is displayed (see error messages). In this case, the "ON" lights
flashes continuously, until the dolly is turned off manually. If the dolly is not turned off manually, the hand control unit will execute an automatic turn-off after 1 minute. In the (normal) case of correct function, the "ON"-indicator will light continuously.

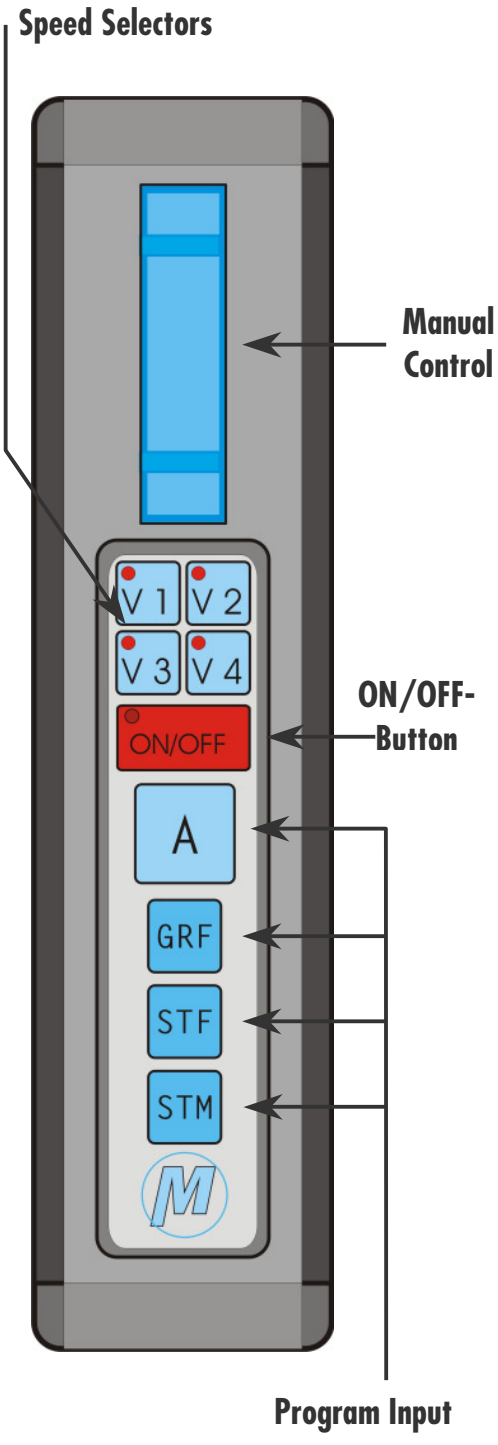
Manual Operation

The drive speed of the column is controlled in both directions through the "Manual Control". With the assistance of the 4 speed selector buttons, the following 4 speed areas can be selected:

V1: slow movement (20%)
V2: middle movement (35%)
V3: middle movement (60%)
V4: fast movement (100%)

With a battery voltage of 48 V and speed range and ramp 1 selected, the coloumn's lift range of 683 mm can be covered in approx. 3.1 sec. (ramp selection is discussed in detail on page 5). If the manual control has not been used for more than 30 minutes, the control automatically turns off the dolly completely. 60 seconds before turnoff, the "ON"- and the "V"-lamps start to flash. After turn-off, the selected speed range is stored. To turn the dolly on again, the ON/OFF button must be pressed.

HANDREGLER



MovieTech Magnum Dolly Electronics

Advanced Version

Drive Ramp Selection

With the Magnum Dolly it is possible to select 4 different degrees of acceleration and deceleration of a movement. This enables one to select the necessary degree as per the individual requirements.

With the Ramp Selector, 4 different degrees can be selected as follows:

1. Ramp 1 (acceleration 100%)

Very hard acceleration and abrupt deceleration upon letting go the Manual control. A gentle deceleration is only possible through the necessary operation of the Manual Control. Not recommended for use with the Duo Jib.

2. Ramp 2 (acceleration 80%)

Somewhat softer acceleration and deceleration enabling smooth starting and stopping with 1 or 2 men on board camera crew, even upon suddenly letting go of the Maual Control. For use with the Duo Jib it is required to manually select degree of smoothness of acceleration and deceleration.

3. Ramp 3 (acceleration 70%)

For operation with Duo Jib. Acceleration and deceleration is somewhat softer than Ramp 2.

4. Ramp 4 (acceleration 60%)

Enables absolute smooth acceleration and deceleration for use with Duo Jib. Even abrupt pressing and letting go of the the Manual Control results in soft starting and stopping.

The 4 ramping degrees also function in connection with the programming operation. Furthermore, the selected ramp also functions as said on the end switch areas ensuring the required acceleration and deceleration in these areas.

IMPORTANT: BEFORE RESELECTING A RAMP, SWITCH OFF DOLLY.

The reselection of a Ramp will only work when the dolly has been switched off. Due to technical reasons the reselection will only be registrated upon activation of the dolly. Therefore a reselection during operation will not be recognized.

MovieTech Magnum Dolly Electronic

Advanced Version

Program Operation

The advanced version of the Magnum Dolly offers a wide range of program possibilities which are provided as follows:
Channel 0: Resetting of the column drive range i.e. start and end position
Channel 1: memorizing and recall of up to 30 positions (as with older version)
Channel 2: Memorizing and recall of a further 30 positions
Channel 3: Memorizing and recall of a complete movement sequence

It is possible to reselect a Program Channel at any time by using the Program Channel Selector. The individual possibilities are as follows.

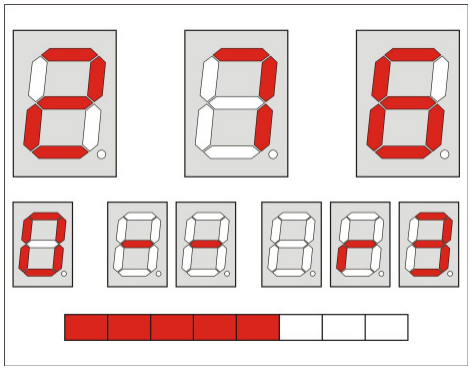
Program Channel 0

Channel 0 offers the following possibilities:

1. Operation without program input
2. Reselection of column drive range
3. Load display in Duo Jib operation
4. Display reading for Running Time Meter

1. Operation without program input :

In Channel 0 the operation of the individual program keys in the hand control have no effect. All functions can only be activated by the simultaneous pressing of 2 program keys. This has the effect that it is practically impossible to mistakenly activate the program procedure. Therefore users who prefer to operate the Magnum Dolly manually must simply select the Program Channel 0 and need not concern themselves with further particular details regarding the programming possibilities.
In this case the display shows the following (also see page 21):



The large 3 digit display shows the actual position of the column in mm, here 276 mm. The 1 digit Channel Display shows that Channel 0 has been selected. The 2 digit Program Display shows "--". There are no special functions activated. The 3 digit Information Display, bottom right, shows "r3" therefore the ramp 3 is activated. The Linear Display shows the battery voltage. 5 of the 8 digits are alight which means that the battery voltage is 23 V (also see p. 21).

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Advanced Version

Program Channel 0

2. Selecting the Column's lift range:

Under certain circumstances when operating the Magnum Dolly it may be necessary to reduce the lift range of the column. For example, when operating the Duo Jib under a low ceiling or under a low hanging lighting set-up.
The Magnum Dolly's programming facility caters for such circumstances as follows: When Channel 0 is selected it is possible to dictate a new bottom and top end position via the programming keys in the hand control unit. The column can therefore be driven only within this new lift range until otherwise instructed.

To memorize and to cancel the limits it is necessary to press 2 of the programming keys simultaneously
(always GRF + another key).

There are:

Current position is set as bottom limit.
This position cannot longer be passed.

Current position is set as top limit.
This position cannot longer be passed.

Both positions are cancelled.
The complete lift range of the column can be driven.

The memorized limits remain programmed even when the dolly has been switched off. The limits are only set on Channel 0; upon switching to channel 1,2,3 the complete lift range may be driven. Upon switching back to channel 0 the limits will be automatically reactivated.

The following 2 examples describe the programming input sequence and in turn the relative displays.

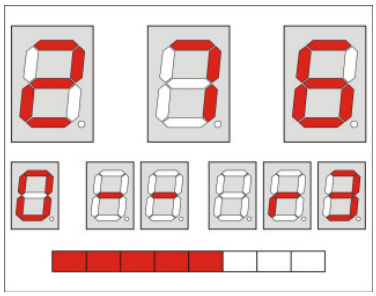
MovieTech Magnum Dolly Electronic

Advanced Version

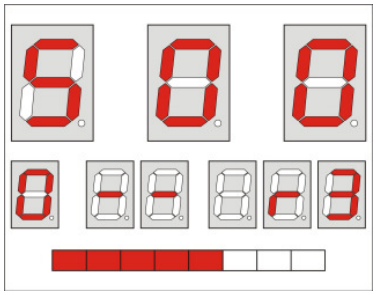
Program Channel 0

Reselecting the Column's lift range. Example 1

It is required to set up a top limit of 500 mm. Assuming that the column is at a current position of 276 mm. In this case the displays will show the following (see diagram):



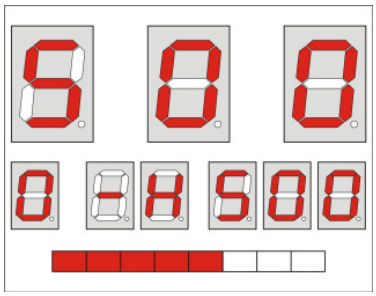
Firstly it is necessary to manually drive the column (using the manual control) to the requested stop limit. The new position (here 500 mm) will be shown in the display (see diagram).



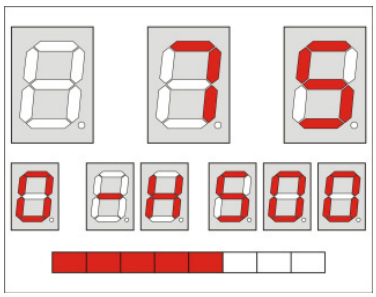
To register the current position as top limit it is necessary to simultaneously press

GRF + A

On the 2 digit Program Display "H" for "HIGH" will be shown and on turn the 3 digit Information Display will show "500".



The set top limit of 500 mm can not be crossed. The column now decelerates smoothly at 500 mm. The display continues to show "H 500" regardless of the current column position (here 75 mm) constantly informing one of the top limit.



To set a bottom limit the same sequence should be followed with the difference that instead of pressing GRF + A it is necessary to press the combination GRF + STM (see example 2).

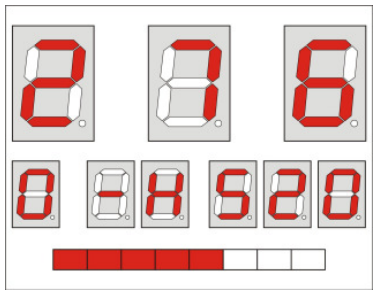
MovieTech Magnum Dolly Electronic

Advanced Version

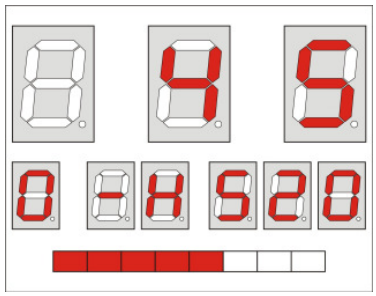
Program Channel 0

Reselecting the column's lift range. Example 1

It is required to set a new lift range between 45 and 520 mm. Assuming that the column is at a position of 276 mm and the top limit has been set at 520 mm as per example 1. The displays will show the following (see diagram):



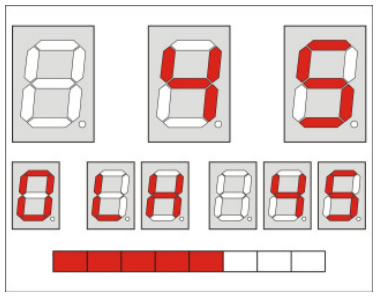
Firstly it is necessary to manually drive the column (using the manual control) to the requested bottom limit. The new position (here 45 mm) will be shown on the display (see diagram).



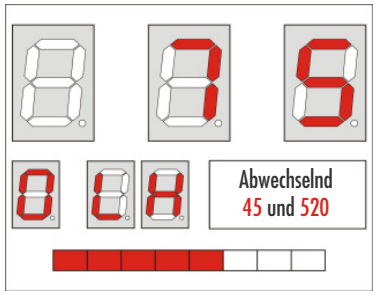
To register the current position as top limit it is necessary to simultaneously press

GRF + STM

On the 2 digit Program Display "H" for "HIGH" will be shown and on turn the 3 digit Information Display will show "500".



The set lift range limit between 45 mm and 520 mm cannot be crossed. The column now decelerates smoothly at the set limits. The display continues to show "LH" as a reminder that limits have been set. The Information Display will show the set limits alternatively when the column is not in motion. During upward movements the top limit will be shown and during will be shown and during downward movements the bottom limit will be shown.



To set a bottom limit the same sequence should be followed with the difference that instead of pressing GRF + A it is necessary to press the combination GRF + STM (see page 28).

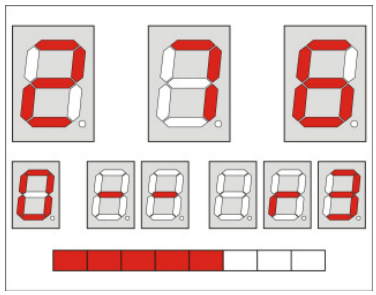
MovieTech Magnum Dolly Electronic

Advanced Version

Program Channel 0

Resetting of the full lift range

To cancel the given set limits it is necessary to press the keys



It is not possible to cancel only one limit. The displays “L” and “H” will disappear upon cancel- lation as well as the respective digits shown on the Information Display. The column can now be driven through its complete lift range i.e. 0 to 683 mm. The information Display will once again show the selected ramp (this time 3).

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Advanced Version

Program Channel 0

Changing to other Channels

It is possible to change program channels at any time without effecting the respective programs. It is therefore possible to switch from Channel 0 to Channel 1 at any time should it be necessary for example to avail of the full lift range or to use a programmed sequence. The set limits on Channel 0 remain memorized and upon switching back to Channel 0 will become immediately active.

Should the column be outside the at limit after returning to Channel 0 from Channel 1, 2 or 3 it may only be driven in the direction which will return it to the set lift range area. Upon entering the set lift range the set limits cannot be exceeded.

Examples:

Channel 0 has been programmed with a set lift range from 50 to 500 mm. At some stage the user switches to Channel 1,2 or 3 and drives to a position of 600 mm. From this position, upon switching back to Channel 0 it will only be possible to move the column downwards until it reaches the set top limit of 500 mm. Upon reaching the set top limit of 500 mm and entering the memorized set lift range the bottom and top limits will be activated.

Movie Tech Magnum Dolly Electronic

Advanced Version

Program Channel 0

3. Payload Display for Duo Jib

An important factor for efficient operation of the Magnum Dolly with the Duo Jib is the correct selection of counterweights. Should too many or too few counterweights be used, the result will be a reduction of speed in one of the respective directions and an overload on the drive motor and mechanics.

Under such circumstances the battery voltage will also drop at a faster rate. Should the column be operated for a longer period of time it could result in the motor overheating.

However, it is possible to measure the correct balance between load and counterload by gauging the required motor performance, which can be indicated by the battery voltage drop during motion. In case of correct balance, the battery voltage drops by the same amount for both drive directions, otherwise the motor must deliver more power for upward or downward motion, respectively, causing a higher battery voltage drop. Therefore, the battery voltage indicator can be used as a payload display.

Here is an example:

Display for Motor without load:

In case of correct balance, the battery display shows the same voltage for both directions:

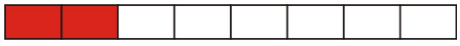
Upward Motion

Downward Motion

In case of one- sided balance, in one direction a higher motor performance is necessary:

Upward Motion

Downward Motion



In this case, for a downward move, a higher motor performance is required. This means that the number of counterweights is too high.

Movie Tech Magnum Dolly Electronic

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Program Channel 0

4. Display for Operational and Running Time Meters

The Magnum Dolly has 2 non- resetable Time Meters:

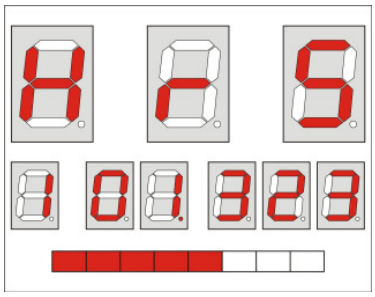
1. Total Operational Time Meter (from switch on to switch off).
2. Total Running Time Meter (actual movement of column).

The timing process will be interrupted in the event of an electronical error in order to prevent an unplanned resetting of the meter. Meter 1 will generally show a higher amount of hours than meter 2, because the column is not always moving when switched on.
To gain access to the meters certain keys on the Hand Control Unit must be activated upon switching the dolly on (approx. 1 sec. before switching on and approx. 3 sec. after switching on).

Meter 1
Total Operational Time

Meter 2
Total Running Time

Display



Meter 1:

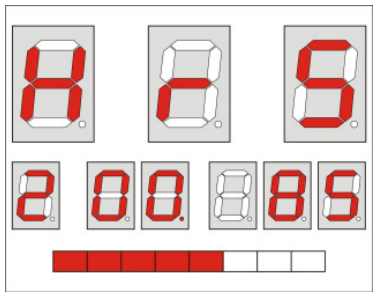
Total Operational Time

Meter reading: 1323 Hours

Meter 2:

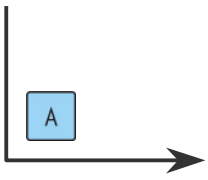
Total Running Time

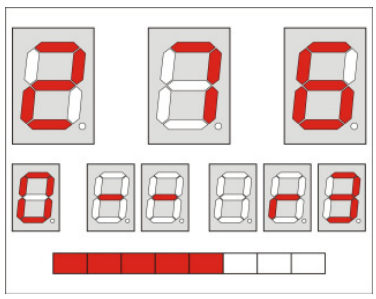
Meter Reading: 85 Hours

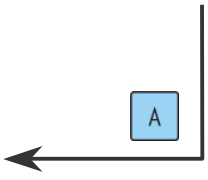


The Channel Display shows "1" for Meter 1.

The Channel Display shows "2" for Meter "2".







Press Key A to return to normal operational Display.

Movie Tech Magnum Dolly Electronic

Advanced Version

Program Channels 1 and 2

General:

Channels 1 and 2 provide the same programming facility as with previous models of the Magnum Dolly.

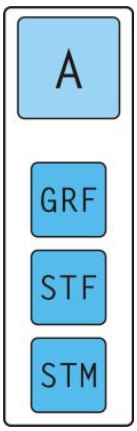
A certain amount of set positions (up to 30) can be memorized and recalled in the same order as they were entered. The speed between each position is the fastest speed achieved upon entering the individual positions. The advanced version of the Magnum Dolly offers the possibility to memorize 2 separate sequences. One on Channel 1, the other on Channel 2.

This results in the opportunity, for example, to program on Channel 1, 5 positions and on Channel 2, 10 completely different positions. Alternatively it is possible to program on both channels the same positions but select different speeds.

Users who are familiar with the earlier versions of the Magnum Dolly and do not feel the need to familiarize themselves with the new system must simply select Channel 1 or Channel 2 and can therefore operate the dolly in the familiar manner they are used to.

For users who are not familiar with the programming facility, here is a detailed explanation.

The Hand Control Unit is equipped with 4 programming keys. The markings on the keys (see diagram) have the following meanings (see p. 33).



Movie Tech Magnum Dolly Electronic

Advanced Version

Program Channels 1 and 2

Key

A	Action
GRF	Go to ReFerence
STF	STore reference Flag
STM	STore Movement

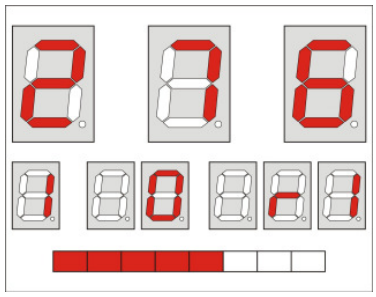
Example:

It is requested to program the following sequences:

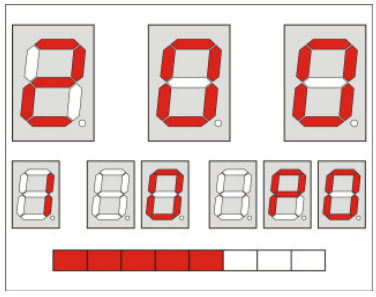
1. A slow paced move from position 200 mm to 370 mm
2. A fast paced move from position 370 mm to 600 mm
3. A medium paced move from position 600 mm to 300 mm

Consider for example that the column is at a position of 276 mm and there are no positions programmed. The display will show the following:

Position 276 mm, Program Channel 1,0 movements in program, Ramp 1 is selected.



Firstly, the starting position for the first move must be reached i.e. 200 mm. Upon reaching 200 mm press STF. The display appears as in the accompanying diagram:
The Information Display shows the starting position "P0" i.e. zero position. The Program Display still shows "0" Display still shows "0" because a move is defined as a start, speed and end position, at this stage of sequence only the start position has been entered.

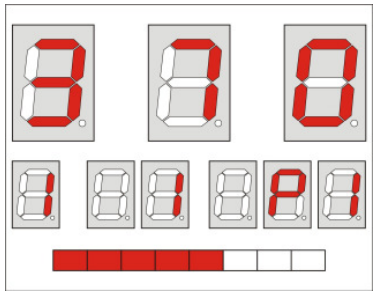


Movie Tech Magnum Dolly Electronic

Advanced Version

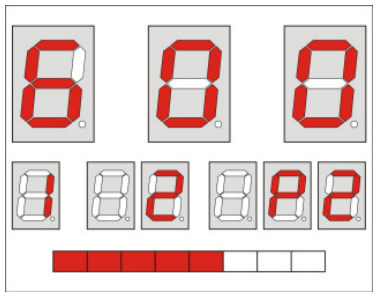
Program Channels 1 and 2

For the next step it is required to program the movement to the targeted position (370 mm) at the required slow speed. The column should be driven at the required speed to position 370 mm. Now press STM. The display will show the following: 370 mm, Channel 1, 1 movement entered, column at first memorized position i.e. "P1".



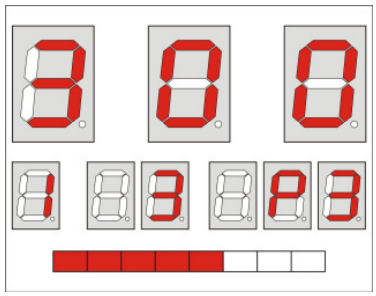
Upon entering the first position the column now can be driven at the requested fast speed to the next position (600 mm). Once again press STM upon reaching the requested position. The display will show the following:

600 mm, Channel 1, 2 movements entered, column at second memorized position i.e. "P2".

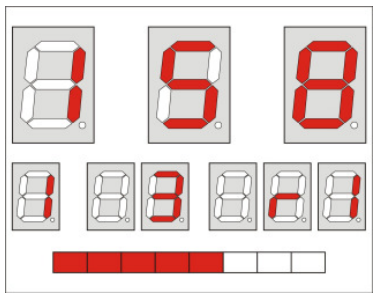


At a medium speed now drive the column to the next position (300 mm). Upon reaching the required position press STM. The 3 positions have now been entered requested. The display will show the following:

300 mm, Channel 1, 3 movements entered, column third memorized position i.e. "P3".



The entered positions will remain memorized even when the dolly has been switched off or when additional manual movements are made. When manual movements are being made the Information Display will show the selected ramp (here r 1). The number of entered movements will also be shown. Our diagram depicts the display in the event of an manual movement in the event of a manual movement at 158 mm.



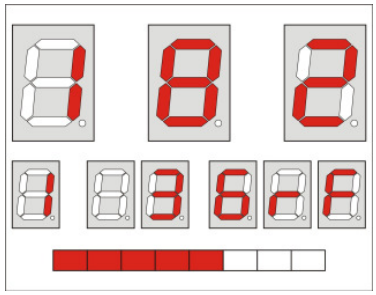
Movie Tech Magnum Dolly Electronic

Advanced Version

Program Channels 1 and 2

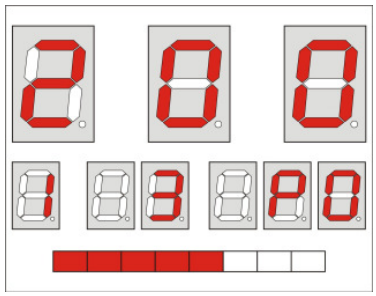
To recall the memorized positions it is required to return to the starting position "P0". To do this press the key "GRF". During the drive to the starting position the display will show the following:

Present position 182 mm, Channel 1, 3 movements entered, Dolly on drive "Go to Reference".



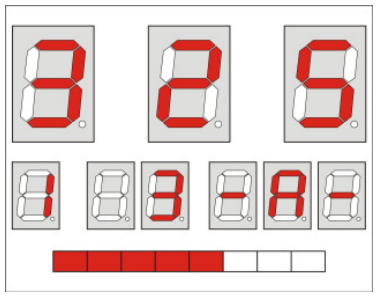
When the column reaches the reference position (in our example 200 mm) it will brake gently. It is now ready to repeat the respective movements. The display will show the following:

Present position 200 mm, Channel 1, 3 movements entered, dolly on starting position "P0".



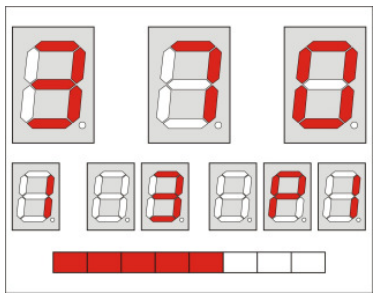
By pressing "A" for "Action", the column will drive automatically with the memorized speed to the first position (in our example 370 mm). During the movement the display will show the following:

Present position 325 mm, Channel 1, 3 movements entered, dolly in Action "A".



When the column reaches the memorized position (in our example 370 mm) it will stop automatically and "P 1" will show on the display.
All memorized positions can be recalled in the same manner i.e. by pressing key "A". Upon reaching position 1 the display will show the following as per diagram:

The Magnum Dolly memorizes up to 30 positions in both Channels 1 and 2.

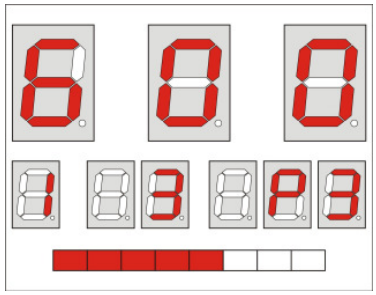


Movie Tech Magnum Dolly Electronic

Advanced version

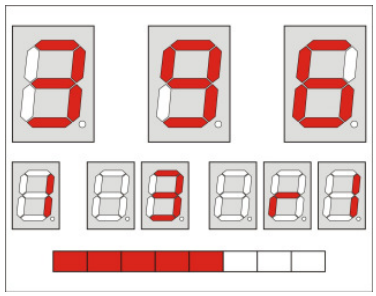
Program Channels 1 and 2

In the same manner as described in our example the positions "P2" and "P3" as well as the memorized speeds can be recalled by pressing key "A". At the end of the sequence the column will arrive at the position 600 mm (position 3).



Emergency Stopping

Every programmed movement of the Magnum Dolly (recalled by "GRF" or "A") can be immediately interrupted, without having to switch the dolly off, by pressing the Manual Control.
Pressing the Manual Control and therefore moving it out of its central position results in an abrupt, immediate stopping of the column.



The column has now returned to manual operation.
The Information Display confirms this by showing the selected ramp (here r 1).

The entered movements remain programmed; the Program Display shows 3 movements entered. To return to the programmed sequence it is necessary to return to "P0" by pressing "GRF".

Movie Tech Magnum Dolly Electronic

Advanced Version

Program Channel 2

As of March 1995 the following changes have been made in the function and operation of Channel 2. As with the previous version it is still possible to store up to 30 positions. The procedure to enter the positions with the keys STF and STM remains unchanged and corresponds with Channel 1 (page 32 to 36).
The recalling to the position P0 by pressing key GRF remains unchanged.

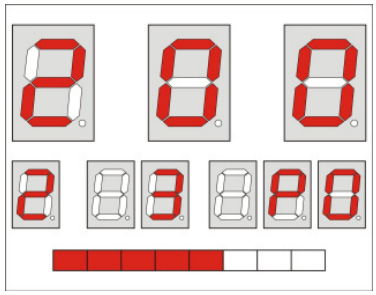
The change made to Channel 2 is that it is now possible to manually control the speed of movement between each of the programmed positions as opposed to Channel 1 and the previous version of Channel 2 i.e. the speed of a movement between two positions is not registered when entering a sequence.

The individual positions may now be reached at any speed the dolly operator requires and in turn the entered set positions act as pre-set stops. The Magnum Column stops on the pre-set position reliably and exactly.

For an example of the procedure please read the following:

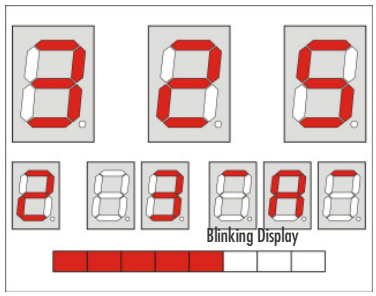
If, for example, the same 3 positions as in our example on page 16 have been stored and the column has been driven to P0 by pressing GRF. The display will show the following:

Position 200 mm, Channel 2 is selected, 3 positions have been stored, the column is at the reference position "P0".



The speed between positions can be controlled exactly as To go to position 1 (in our example 370 mm), press key A for "Action". The blinking Information Display shows "A". There is not yet any column movement. Movement is activated by pressing the Manual Control in the correct direction of the stored position 1.

The speed between positions can be controlled exactly as with normal manual operation.



Movie Tech Magnum Dolly Electronic

Advanced Version

Program Channel

Depending on the location of the stored position, the Manual Control must be pressed up or down. The column will remain stationary if the Manual Control is pressed in the wrong direction. It is not possible to change the direction of movement between two stored positions. It is possible to stop and increase/decrease the speed.
The Information Display indicates the correct possible movement direction:

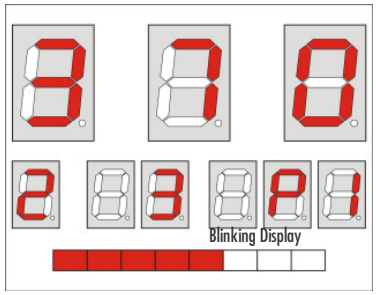
Blinking Display

Next stored position is higher, upward movement possible, press Manual Control up.

Blinking Display

Next stored position is lower downward movement possible, press Manual Control down.

When the column reaches the first stored position (in our example 370 mm) it will stop automatically. The blinking Information Display shows "P1". If the Manual Control is released the Information Display stops blinking and shows a constant "P1". The programmed movement is finished.



The following stored movements can be activated in the same fashion (press key "A" then press the Manual Control). At the end of each programmed movement or stop (release the Manual Control; display stops blinking), it is at this stage possible to manually drive the column in either direction via the Manual Control. To commence a stored sequence it is necessary to first press GRF to go to the reference position. The movement between any stored positions can at any time be stopped by releasing the Manual Control.

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Program Channel 3 (Motion Control)

General:

With Channel 3 it is possible to memorize a complete movement including various speeds, movement stops, direction changes etc. The movement can be recalled exactly as it has been programmed.

A complete movement can take up to 5 minutes or depending on the length of the stops up to 15 minutes.
It is possible to stop the sequence at any time.

The memorized sequence will not be cancelled by switching the dolly off.

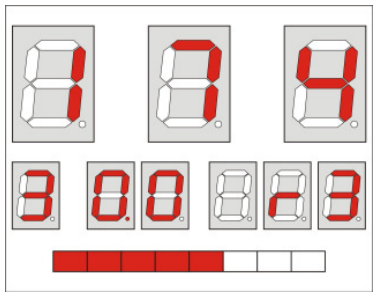
Programming a sequence on Channel 3 does not influence in any way the memorized limits on Channel 0 or the sequences programmed on Channels 1 or 2. Each Channel functions completely independently of the other.

Manual operation on Channel 3 functions in exactly the same manner as with the other channels; there are no special orders to observe.

The Hand Control keys provide the same functions as with previous models of the Magnum Dolly (see Channels 1 and 2).

Programming a Movement:

Taking for example that the column is tuned to Channel 3 and the current position is 174 mm. There is no sequence memorized and ramp 3 has been selected. The display will show the following:



The Position Display shows 174 mm. The 1 digit Channel Display (bottom left) shows Channel 3. The 2 digit Program Display refers to Channel 3 andindicates that no sequence has been programmed i.e. "00".
The Information Display shows that ramp 3 is selected i.e. "r 3".

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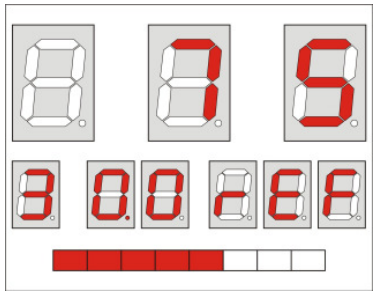
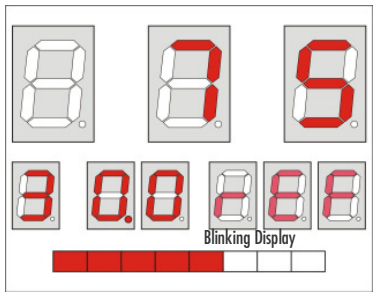
Program Channel 3



The first step is exactly the same as with Channels 1 or 2 i.e. a reference or start position must be entered. It is therefore necessary to manually drive the column to the required position. In our example it is 75 mm.
Press “STF” the display will show the following:

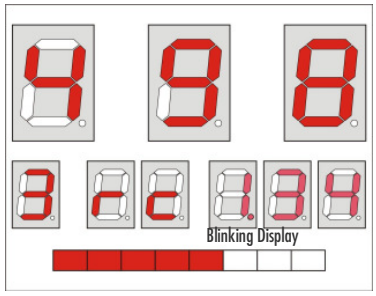
Position 75 mm, Channel 3 selected, length of memorized movement in minutes "00". "rEF" means "column at reference position".

A memorized sequence will be cancelled upon pressing STF



To commence the programming of a sequence it is necessary to press STM. The column is now in the state of "record stand-by". To indicate this the Information Display showing "rEF" starts to blink. The recording of a sequence can now begin.

The recording is activated by pressing the Manual Control. Should the recording not be activated within 10 seconds of pressing STM the state of stand-by will end and the display will stop blinking. In the event of incorrectly activating "record stand-by", pressing STM once again will reverse the procedure. In this case the display will also stop blinking.
By pressing the Manual Control the recording procedure will be activated and the display will show the following:



"rc" indicates that the sequence is being recorded. The blinking Information Display indicates the length of the recorded sequence (here 1 minute and 34 seconds).
The current position is 498 mm. The sequence will be recorded exactly with all stops as well as with all changes in height, direction, speed etc.

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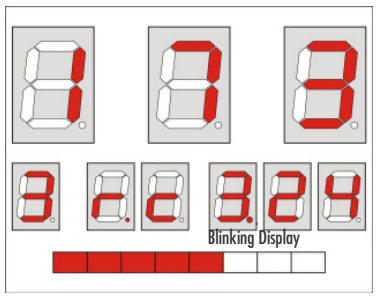
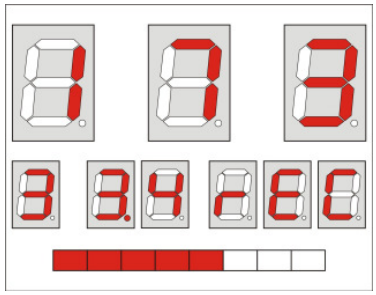
Program Channel 3

Ending the Recording

The diagram shows the display in the case of a running sequence time of 3 minutes and 24 seconds and at a stopped position of 173 mm which should now be entered.



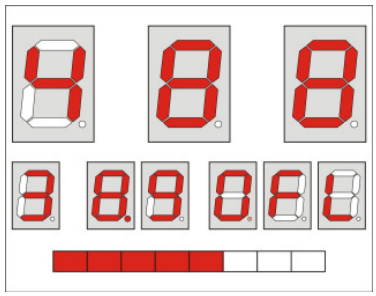
To enter, press STM. The sequence is now ended. The Information Display stops blinking and shows "rEC" to indicate that the sequence has been recorded. The Programm Display shows the length of the recorded sequence i.e. 3.4 minutes.



Recording procedure the display "rEC" will disappear and the Information Display will once again show the selected ramp (r 1 to r 4). The length of the recorded sequence will remain in view on the Program Display.

Maximum Recording Time

During the recording, sequence data such as position, direction etc. will be memorized at a rate of 80 data per second. That means that a sequence with more speed and direction changes requires more memory capacity than a sequence with more pauses and less speed and direction changes.
In practical terms this means that sequences with only short pauses have a capacity of approx. 4 to 5 minutes and that the sequences with long pauses can carry on for 15 minutes or more. Upon reaching the end of the memory capacity the Information Display will show "OFL" meaning "overflow". In this moment the sequence will be automatically recorded so ending the recording sequence. This will have no effect on the manual operation.



MovieTech Magnum Dolly Electronic

Advanced Version

Program Channel 3

The Pause at the end of a Recording Sequence

The pause or break at the end of a recording sequence will not be recorded. The recording of a sequence finishes upon reaching the end of the last movement and coming to a stop. This has the effect that a sequence of, for example, 8 minutes and 30 seconds will not show on the Program Display as 8.5 minutes but instead as 6.5 minutes in the case of where the last 2 minutes were not a movement but a pause.

Should it be forgotten to end a sequence and the dolly it then switched off, the sequence will not be recorded.

A recorded sequence remains memorized should the dolly be turned off or should another channel be selected.

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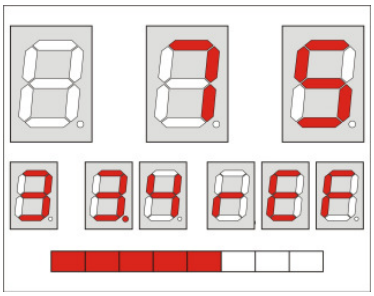
Advanced Version

Program Channel 3

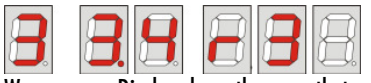
Recalling of a Recorded Sequence

To recall a sequence recorded on Channel 3 it is necessary to apply the same procedure as with Channel 1 (see p.35). By pressing GRF the column will return to the reference or starting position. During the movement the display will show "GRF" and upon reaching the position will show "rEF" to indicate the reference position..



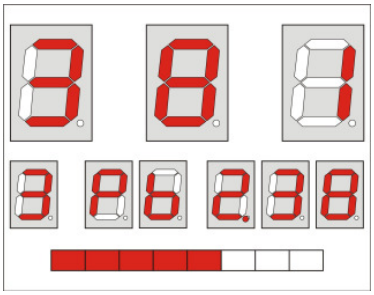
Important: For technical reasons the same ramp that is selected during the recording phase must also be selected during the recall phase. If this is not the case the column will not go to the reference position upon pressing "GRF". Instead, the Information Display will indicate the ramp that was selected during the recording phase for as long as the GRF key is pressed.

Correct ramp: Display shows „GRF. Dolly moves to reference position.



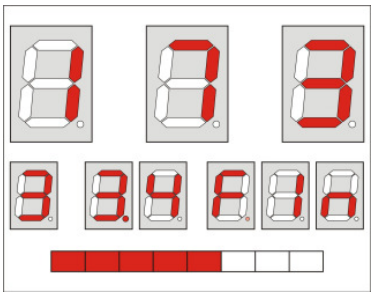
Wrong ramp: Display shows the ramp that was selected during recording phase.

Upon reaching the starting position, press „A“ to recall the recorded sequence. During the recall the Programm Display will show "PB" indicating "Playback". The Information Display will count the length of the recorded sequence (in our example 3 min.24 sec.) in reverse order enabling the operator to see how much time remains for the recorded sequence (here 2 min.38 sec.)



The recall can be interrupted (as with Channels 1 and 2) at any time by pressing the Manual Control (see p. 36).

Upon reaching the end of the repeated sequence the Information Display will show "FIn" indicating "finished". The Programm Display indicates the length of the recorded movement (3.4 min.). By pressing the Manual Control the column returns to manual operation and the Information Display shows the selected ramp.



MovieTech Magnum Dolly Electronic

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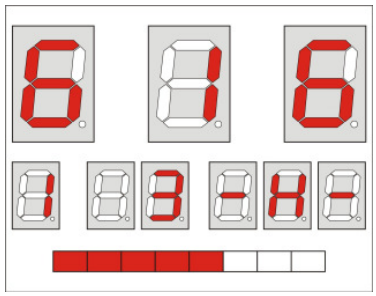
Function of the end switches

The Magnum Dolly is equipped with 2 end switches which can be found in the column approximately 10 cms from the top and the bottom respectively. Should the column find itself within the vicinity of either of these end switches upon switching on the dolly, it is only possible to drive the column in the direction that will enable it to clear the respective switch i.e. in the bottom end switch area, upwards, in the top end switch area, downwards. Therefore the dolly cannot be driven against the mechanical stops in case the position stored by the electronic is not the same as the actual position e.g. if the emergency back-up switch has been used before.
On Channels 1, 2, 3 access to the recorded programs is only possible upon clearing the end switches. However in Channel 0 the recorded limits are immediately accessible.
Upon switching the dolly on and the column is in one of the end switch areas and there is a recorded sequence on the selected channel, the Information Display will indicate respectively "H" for "high" and "L" for "low".

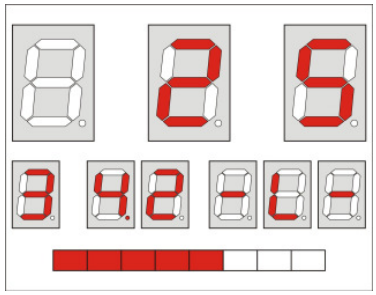
Example 1: Upon switching on, in low position:

Channel 1 selected;
3 set positions memorized;
Position within the top end switch area, therefore program keys non-functional and only downward manual operation possible.



Example 2: Upon switching on, in low positions:

Channel 3 selected;
Movement with 4,2 minutes memorized;
Position within the bottom end switch area, therefore program keys non-functional and only upward manual operation possible.



As soon as the respective end switch is cleared the column can be moved in both directions and the programming is once again functional. The Information Display will show the selected ramp and the display "H" or "L" will disappear.

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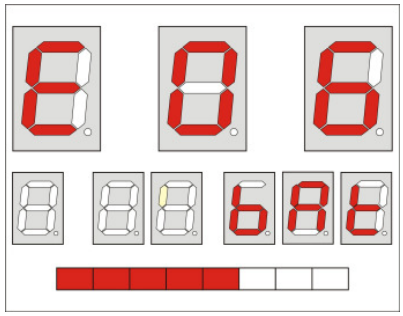
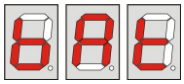
Error Display

If during operation a fault occurs, the column will stop and the 3 digit Position Display will show an error code. The numbers of the Channel and Programm Display will disappear and the Information Display will assist in referring to the possible source of the fault. The Position Display will show the letter "E" for "Error" plus one of the additional numbers 01 to 13. The Information Display assists the search for the error by showing 3 letters describing the possible fault.

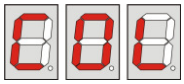


In the following example the dolly is out of order because battery voltage has dropped below 17 V. The Position Display shows "bAt" as an indication that the battery is the error source.

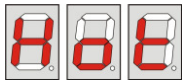
Information Display Report:



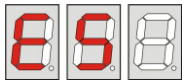
„bAt" = Battery



„COL" = Column



„Hot" = Motor overheated



„ES" = End Switch

„Hdc" = Hand Control

„dEF" = Defective Electronic

Error Code	Error Source	Information Display
E 01	Motor temperature too high	Hot
E 02	Incorrect voltage input 15 V at end stage	dEF
E 03	Both end switches simultaneously activated	ES
E 04	Column control button activated to soon upon switch on	Hdc
E 05	Incorrect signals from speed selector switch in hand control unit	Hdc
E 06	Battery voltage below 17 V	bAt
E 07	Incorrect voltage on brake	dEF
E 08	No voltage on brake (brake possible not connected)	dEF
E 09	Difference between supposed and actual position too high (possible that column is mechanically blocked or that drive movements are uncontrolled)	COL
E 10	Voltage 32 V in end stage incorrect	dEF
E 11	Input voltage 5 V for processor incorrect	dEF
E 12	Input voltage 5 V in end stage incorrect	dEF
E 13	Hand control poti exceeding allowed limits	Hdc

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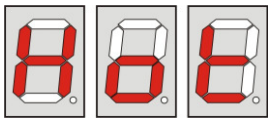
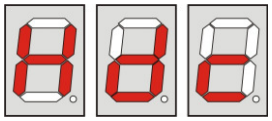
Error Messages

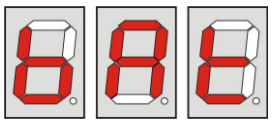
The following errors can be caused by incorrect use:



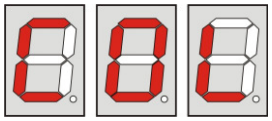
An overheated motor can occur by driving the column too long with either too much or insufficient payload. In this case switch the column off and let the motor cool down.



Upon activation, the self diagnostic electronic goes through a system check to ensure that no faults are present. This takes approx.1-2 seconds. During this time the manual control should not be pressed. If it is pressed and E04 occurs, switch the column off and than restart.



This signal occurs when the battery voltage sinks below 17 V for more than 2 seconds. The battery should be recharched as soon as possible.



This fault can occur when the motor, due to a mechanical blockage, is not able to provide the correct amount of revolutions as instructed by the electronic. It can also occur when due to a defective electromagnetic brake the column moves uncontrolled or the digital rotatable encoder is defective.

Emergency Back-up Switch

The Magnum Column contains an integrated emergency back-up. It can be found directly above the connection for the hand control cable in the electronic housing. For easy access it is necessary to disconnect the hand control cable. In the event of an electronical malfunction the column can be driven up or down by pressing the switch accordingly. The emergency back-up connects the motor directly with the battery and opens the electromagnetic brake for as long as the switch is pressed. The result is a fast, raw movement without any drive ramp control.

IMPORTANT: THERE IS NO AUTOMATIC DECELERATION

Should the column be driven completely to the end, either at the top or bottom and the switch is being pressed, it is possible that motor damage will be caused. It is therefore recommended that the emergency back-up only be used when the electronic is not working.

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Overall View of Program Functions

Key Functions in Switch on Phase
Keys STF or STM approx. 2 secs. Pressed (only Channel 0!)

STM + ON — Shows Total Running Time Meter; not adjustable.

STF + ON — Shows Intermediate Running Time Meter; Reset Meter with GRF.

A — Ends Meter Display and starts normal operation.

Both counters cannot be resetet.

Key Functions Channel 0
Setting of top or bottom limit; Selection of battery or payload display; Pressing of individual keys without function.

GRF + STM — Setting bottom limit

GRF + A — Setting top limit

GRF + STF — Cancel both limits

Key Functions Channel 1 and 2
Each channel individually records a maximum of 30 positions. On Channel 1 the positions and the fastest speed achieved since the last position may be programmed. On channel 2 only the positions may be programmed. The movement between the positions remains manual.

STF — Current position is recorded as reference/ start position. Previously recorded program is cancelled.

STM — Current position is recorded as one of 30 possible positions per channel.
On channel 1 the fastest speed achieved between positions is also recorded.

GRF — Recalls column to reference/start position. Movement can be stopped by pressing Manual Control.
The speed of the movement depends on the selected speed range at time.

A — Starts movement to next position. Channel 1: The maximum speed is recalled (see STM) and movement can be stopped by pressing Manual Control. Channel 2: The speed is controlled manually.

Key Functions Channel 3; Motion Control Operation
Recording and recalling of a complete sequence including various speeds, direction changes and pauses. Maximum drive movement 3 mins., for movements with long pauses up to 15 mins.

STF — Current position is recorded as reference/start position. Previously recorded program is cancelled.

STM — Double Function: 1. Starts recording of sequence once the reference position has been set.
2. Ends the recording of sequence.

GRF — Recalls column to reference/start position. Movement can be stopped by pressing Manual Control. Drive speed depends on selected speed.

A — Starts the recorded sequence provided the column is at the reference/start position. Sequence can be stopped by pressing Manual Control.

Note: Hand Control key functions only functional when column is not moving!

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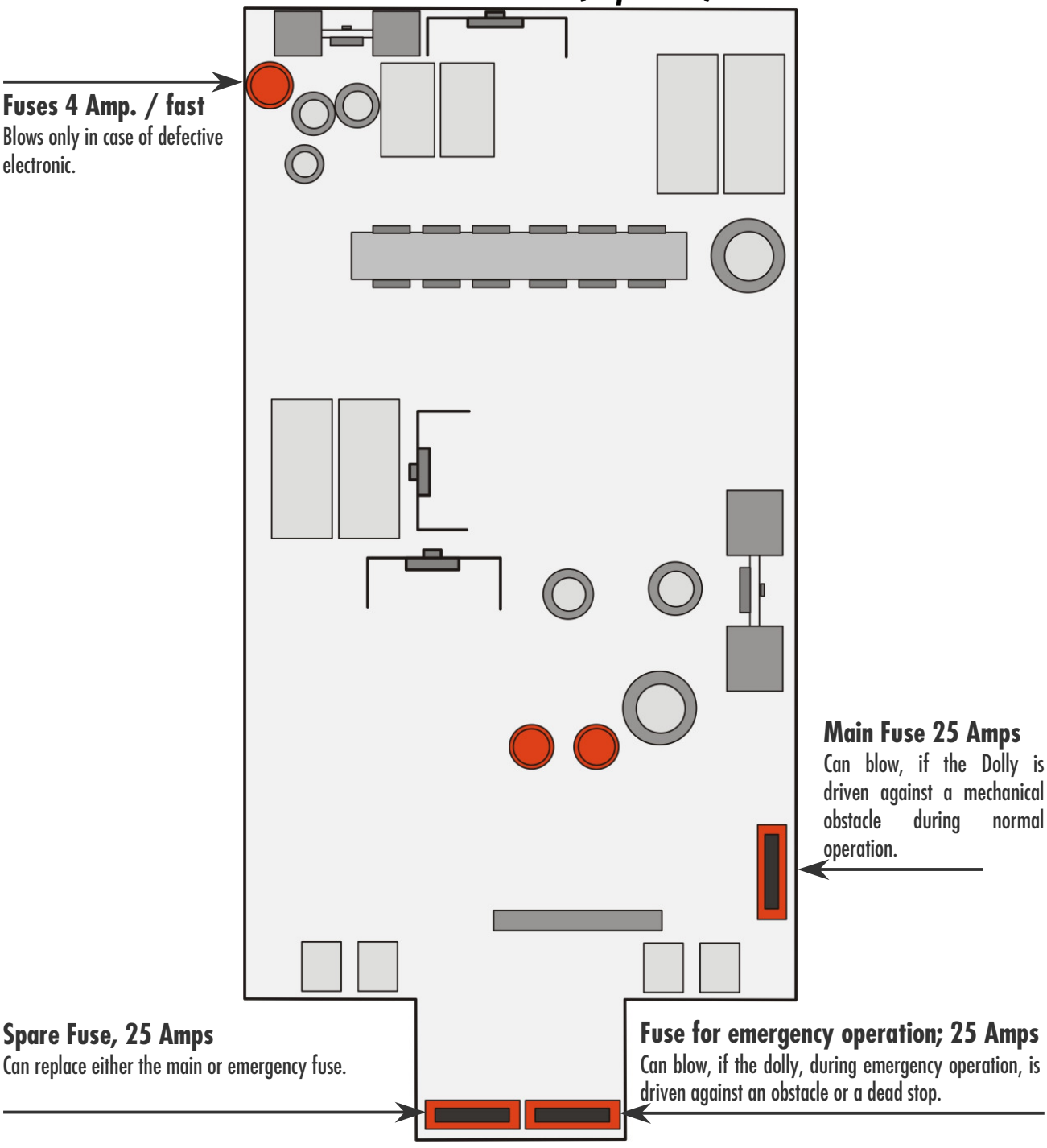
Position plan of the fuses

Lower Circuit Board (Top View)



Fuses 4 Amp. / fast
Blows only in case of defective electronic.

Main Fuse 25 Amps
Can blow, if the Dolly is driven against a mechanical obstacle during normal operation.

Spare Fuse, 25 Amps
Can replace either the main or emergency fuse.

Fuse for emergency operation; 25 Amps
Can blow, if the dolly, during emergency operation, is driven against an obstacle or a dead stop.

MovieTech

Movie Tech AG, located in Munich, is one of the leading manufactures of products and solutions for the film industry. The product line of Movie Tech AG includes the hole range of camera cranes, dollys, light systems, remote heads and related accessories. Movie Tech AG purpose is to build professional film equipment to make the work for film teams on the set or in the studios easier. In order to fulfill customer's requests better, Movie Tech AG has branches in the U.S. and Italy.

ABC PRODUCTS

Movie Tech AG acquired the company ABC-Products in January 2000 with the objective to improve the development in the broadcast market. ABC-Products is today one of leading brands in the area of extremely light and high-grade broadcast equipment.

MTS
Media Technical System

Since 2006, MTS equipment has been added to the portfolio of MovieTech AG. MTS - Media Technical Systems - manufactures premium studio equipment, including droparms, pantographs, lighting hoists, and telescopes.

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